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Year: 2020

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## **No Nosocomial Transmission of SARS-CoV-2 between Healthcare Workers in Surgical Departments Unexposed to Covid-19 Patients**

Burkhard, J ; Lacher, S ; Holy, D ; Schenk, P ; Schäfer, C ; Kahr, P ; Schreiber, V ; Farshad, M ;  
Uckay, Ilker

**Abstract:** Background: Covid-19 infections are usually community-acquired, but nosocomial outbreaks among patients and/or exposed Healthcare Workers (HCW) exist. However, the risk of pure nosocomial SARS-CoV-2 transmission between HCWs remained unknown during the first pandemic wave, especially in the absence of exposure to hospitalized Covid-19 patients. Aim: During the first total lockdown, surgical HCW only cared emergency patients. This period is ideal to determine the epidemiology of purely inter-HCW transmission of Covid-19. Clinical Details: This study concerns the period of the total lockdown of the first wave in March-April 2020. It is performed in two different surgical services in Zurich Canton. Outcome: During the first wave of Covid-19, and in the absence of hospitalized Covid-19 patients, we found no confirmed nosocomial transmission of SARS-CoV-2 between HCWs. Conclusion: Nosocomial extensions of the community-based Covid-19 pandemic are reported, but not due to viral interchange between surgical HCWs in hospitals during a total lockdown and the lack of hospitalized Covid-19 patients.

DOI: <https://doi.org/10.29011/2574-7754.100533>

Posted at the Zurich Open Repository and Archive, University of Zurich

ZORA URL: <https://doi.org/10.5167/uzh-201143>

Journal Article

Published Version



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Originally published at:

Burkhard, J; Lacher, S; Holy, D; Schenk, P; Schäfer, C; Kahr, P; Schreiber, V; Farshad, M; Uckay, Ilker (2020). No Nosocomial Transmission of SARS-CoV-2 between Healthcare Workers in Surgical Departments Unexposed to Covid-19 Patients. *Annals of Case Reports*, 5(6):533.

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## No Nosocomial Transmission of SARS-CoV-2 between Healthcare Workers in Surgical Departments Unexposed to Covid-19 Patients

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**Citation:** Burkhard J, Lacher S, Holy D, Schenk P, Schäfer C, et al. (2020) No Nosocomial Transmission of SARS-CoV-2 between Healthcare Workers in Surgical Departments Unexposed to Covid-19 Patients. Ann Case Report 5: 533. DOI: 10.29011/2574-7754.100533

**Received Date:** 10 December, 2020; **Accepted Date:** 14 December, 2020; **Published Date:** 21 December, 2020

### Abstract

**Background:** Covid-19 infections are usually community-acquired, but nosocomial outbreaks among patients and/or exposed Healthcare Workers (HCW) exist. However, the risk of pure nosocomial SARS-CoV-2 transmission between HCWs remained unknown during the first pandemic wave, especially in the absence of exposure to hospitalized Covid-19 patients.

**Aim:** During the first total lockdown, surgical HCW only cared emergency patients. This period is ideal to determine the epidemiology of purely inter-HCW transmission of Covid-19.

**Clinical Details:** This study concerns the period of the total lockdown of the first wave in March-April 2020. It is performed in two different surgical services in Zurich Canton.

**Outcome:** During the first wave of Covid-19, in the absence of hospitalized Covid-19 patients, we found no confirmed nosocomial transmission of SARS-CoV-2 between HCWs.

**Conclusion:** Nosocomial extensions of the community-based Covid-19 pandemic are reported, but not due to viral interchange between surgical HCWs in hospitals during a total lockdown and the lack of hospitalized Covid-19 patients.

**Keywords:** Healthcare workers; Nosocomial transmission; Occupational health; SARS-CoV-2; Surgical wards

### Introduction

The Covid-19 pandemic affects the general community, but nosocomial clusters among patients and exposed Healthcare Workers (HCW) are object of ongoing debate [1]. This “nosocomial part” of the pandemic occurs predominantly in intensive care units, respiratory wards or nursing homes, where the infected patients are treated [1,2]. However, little is known on the interpersonal nosocomial transmission of SARS-CoV-2 between the HCWs

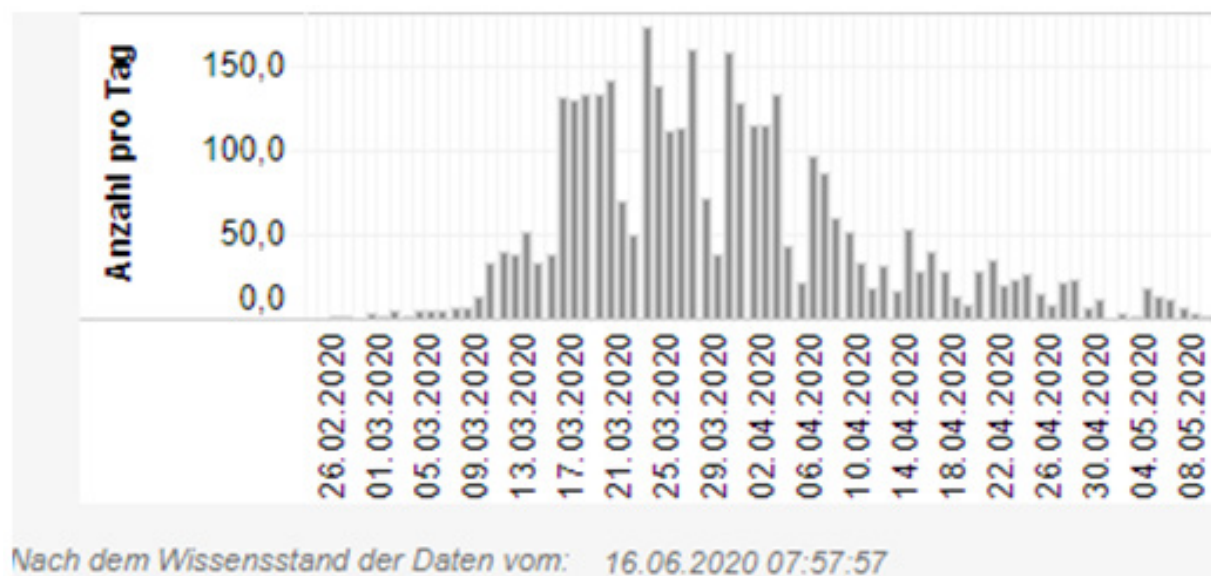
in the hospital during the pandemic; especially in the absence of exposure to hospitalized Covid-19 patients. In the Zurich Canton of Switzerland, Covid-19 patients are not hospitalized on surgical wards.

Furthermore, the federal government imposed a ban on elective surgeries since the beginning of the Swiss epidemic; followed by a visitor ban and voiding of the hospitals from “HCW at risk” [3]. This resulted in a sharp decrease of people in hospitals, leaving healthy HCWs caring for emergency patients solely. This particular situation of the surgical wards is an ideal occasion to investigate the risk of nosocomial SARS-CoV-2 transmission

between HCWs during the peak of a community pandemic. We chose two surgical departments with no hospitalized Covid-19 patients during the entire (first) wave of the novel coronavirus epidemic in the canton for this evaluation.

## Setting

The Balgrist University Hospital is a tertiary center for elective orthopedic surgery with a total of 1250 employees and saw only 1 orthopedic patient with a concomitant diagnosis of community-acquired Covid-19 [4]. The Surgery Service of Uster Hospital (1310 employees and 20 kilometers away) witnessed no hospitalized Covid-19 patients, but HCWs were potentially exposed to Covid-19 patients in other wards [5]. The Zurich epidemic (first peak wave) lasted approximatively from 1 March 2020 to 1 May 2020 [6] (Figure 1). All HCWs with symptoms compatible with possible Covid-19 underwent nasopharyngeal swabs for a PCR-based diagnosis of the viral genome. If confirmed, the infected HCWs stayed in quarantine (at home) during ten days; or continued to work (with masks) when the PCR was negative. There was no post-exposure quarantine of asymptomatic HCWs.



**Figure 1:** Epidemiologic curve of Covid-19 infections in Zurich Canton (First Wave). Vertical axis: Number of PCR-positive cases per day. Horizontal axis: timeline. The arrow indicates the date of the serology samplings of volunteering HCWs.

For positive cases, we conducted an intrahospital contact tracing. All HCWs complied with social distancing (>2 meters) and wearing of surgical mask in presence of respiratory symptoms or after unprotected close contact to a confirmed case. On 27 April 2020, the Canton ordered a general masking duty for all HCWs, but only in healthcare settings and not outside of the hospital. As representatives for most surgical HCWs, we arbitrarily sampled 50 serologies among volunteers on surgical wards between 21-23 April 2020 (qualitative serologies for Covid-specific IgG). These volunteers roughly worked during eight to ten hours per day and thus spend one-third of their daytime inside the hospitals. We used several laboratories, but the most frequent technique based on a SARS-CoV-2 Antibody-Bead Assay (ABCORA), measuring reactivity against 3 antigens (spike proteins S1, S2 and nucleoprotein). All volunteers consented to the analyses that were important for the occupational medicine and the institutional infection control.

## Epidemiological Assessment and Case Series

At Balgrist Hospital, we tested 48 hospitalized patients with respiratory symptoms by PCR. Only 1 was positive for SARS-CoV-2. Among the 96 HCWs with respiratory symptoms, 10 (10%) were Covid-positive. All HCWs reported having acquired the infection in the community. Only one physiotherapist revealed a possible alternative, “nosocomial origin” having occurred during a professional meeting in the hospital. In the surgical wards in Uster, no HCW was positive. Regarding the 53 serologies for the Balgrist and the 20 serologies of Uster, all were negative for IgG, except for two previously infected HCWs at the Balgrist (Table 1). These two PCR-confirmed cases served as a positive control for the serologies. All HCW with negative serologies remained disease-free until today (two months after). Overall, the incidence of documented Covid-19 cases among the Balgrist HCWs was 8/1000 persons. During the same surveillance period and until 16 June 2020, the formal risk for acquiring Covid-19 in the general

population of Zurich Canton was 2.4/1000 persons [7].

n = 53	Balgrist Hospital n = 33	Uster Hospital n = 20
Female sex	14	14
Male sex	19	6
Median age (years)	37, range 27-58	34, range 26-57
- Recent respiratory symptoms	5	4
- - Cough	3	2
- Rhinorrhoea	5	0
- Fatigue	5	1
- Fever >38°C axillary	0	1
Prior positive PCR results	2	0
Negative IgG serology	31	20
Positive IgG serology	2	0
Profession		
- Surgeons	22	14
- Internist working in surgery	1	0
- Nurses	8	6
- Secretary	1	0
- Pharmacist	1	0

**Table 1:** Serology testing among healthcare workers at Balgrist and Uster Hospitals (blood samples 21-23 April 2020 in surgical wards without hospitalized Covid-19 patients).

## Discussion

Nosocomial extensions of the community-based Covid-19 pandemic are reported, but not due to viral interchange between surgical HCWs in the hospital, in the near-complete absence of symptomatic hospitalized Covid-19 patients. The obvious limitations put aside (small sample size; doubtful performance of actual SARS-CoV-2 serologies; possible hidden HCW testing outside of our hospitals; “HCWs at risk” in “home office”; no PCR for asymptomatic HCW; no other immunoglobulins tested besides of IgG), we found no evidence for a nosocomial transmission of SARS-CoV-2 between HCW working in two different surgical departments that were exempt of hospitalized Covid-19 cases [8]. We ignore similar publications in the scientific literature with one recent publication being particularly interesting: A German

research group assessed the spreading potential of an undetected COVID-19 case in an orthopedic service [9]. A 64-year-old man was tested Covid-positive seven days after shoulder surgery.

All 66 HCWs with exposure to the patient underwent oropharyngeal PCR testing. Fourteen HCW (21%) equally showed clinical symptoms compatible with Covid-19. However, SARS-CoV-2 was not detected in any of the 66 PCRs [9]. Even if this article concerns nosocomial patient-to-HCW transmission, it denies the possibility of inter-HCW transmission in a surgical ward with only 1 Covid-19 patient hospitalized (if the negative-predictive value of their PCR is accurate) [9]. Interestingly, our incidence of Covid-19 disease among surgical HCW at the Balgrist Hospital was superior to that of the general population of Zurich Canton. We can only speculate the reasons: the adult age group of our HCWs (in Switzerland, the median age of confirmed Covid-19 cases is 52 years), the urban setting (in contrast to countryside), a lower population of HCW in “home office” than for the general working population; and especially the rigorous testing of HCWs independently of the severity of their symptoms [7,10]. This enhanced testing of pauci-symptomatic HCW very likely increases the diagnosis of Covid-19 when compared to the general population.

## Conclusion

The total lockdown did not lead to inter-HCW transmissions. During the first lockdown in our hospital, in absence of hospitalized Covid-19 patients, we saw no need for additional measures targeting the surgical HCW population; beyond of what was already commonly advised: social distancing, hand hygiene, and wear of surgical masks in close contact with persons with respiratory symptoms [1,3]. We will see how the situation will be in future waves.

## Acknowledgments

We are indebted to Mrs. Tamara Steiner-Lippmann and Ruth Schwab for their valuable help. We thank to all virology laboratories in Zurich.

## Conflicts of Interests

All authors report no conflicts of interest relevant to this article.

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